

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**FOREST SITE PREPARATION**

(Acre)

**CODE 490**

**DEFINITION**

Treating areas to improve site conditions for establishing a forest.

**PURPOSES**

- Encourage natural regeneration of desirable woody plants.
- Permit artificial establishment of woody plants.
- Increase carbon storage in biomass and soils.

**CONDITIONS WHERE PRACTICE APPLIES**

On all lands where establishment of woody plants is desired.

**CRITERIA**

**General Criteria Applicable to all Purposes**

The method, intensity and timing of site preparation will match the limitations of the site, safety, and equipment and the requirements of the regeneration species. Use Table 1 as a guide in determining appropriate site preparation methods.

An appropriate site preparation method (mechanical, chemical, prescribed burning) will be chosen to protect any desirable vegetation.

Maintain necessary filter strips and/or riparian forest buffer areas.

Remaining slash and debris shall not create habitat for or harbor harmful levels of pests, or hinder needed equipment operations, or create undue fire hazard.

Erosion and/or runoff will be controlled.

Soil compaction and soil displacement will be minimized.

Comply with applicable federal, state, and local laws and regulations.

All chemicals will be used in accordance with label guidelines. Chemical containers should be disposed in a safe, approved manner. Follow criteria in PEST MANAGEMENT (595).

Livestock will be fenced out to prevent damage to site preparation areas and woody plants.

**Additional Criteria Applicable to Natural Regeneration**

Existing desirable tree species must be present with the potential for successful natural regeneration and seed production.

**Additional Criteria Applicable to Artificial Establishment**

Underplanting should only be attempted on upland sites with regeneration-deficient stands or on upland sites where conversion to pine is desired. Refer to TREE/SHRUB ESTABLISHMENT (612) for recommended species.

**Additional Criteria for Sequestration of Carbon**

For optimal carbon sequestration, select plants that have higher rates of sequestration and are adapted to the site to assure strong health and vigor and plant the full stocking rate for the site.

## CONSIDERATIONS

The site preparation method should be cost effective and protect cultural resources, wildlife habitat, springs, seeps, wetlands and other unique areas.

Climate, soil properties, topography, existing vegetation, planting methods, and the species selected for planting govern the type of site preparation needed.

Visual quality objectives should be considered when selecting site preparation methods.

Anticipate possible off-site effects and modify the site preparation design accordingly.

Consider personnel safety during site preparation activities.

For complex sites, consult a professional forester for assistance.

When choosing the desirable method of site preparation, consider the growth habits of selected trees and the purpose for which the trees are planted.

If chemical site preparation is used to control vegetation, the potential for surface and/or ground water contamination exists.

When preparing sites in cropland fields, consider the affect that carry-over herbicide residue will have on the planted tree species.

Forest site preparation activities can impact water quality by causing a temporary increase in erosion rates and sediment yield.

Consider selection of plants that have higher carbon sequestration rates.

## PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

## OPERATION AND MAINTENANCE

Repair erosion control measures as necessary to ensure proper function. Access by vehicles during site preparation or after (i.e., before adequate tree and shrub establishment occurs) should be controlled to minimize erosion, compaction and other site impacts.

## PRACTICE SPECIFICATIONS

Proper site preparation methods are needed to reduce competition from existing vegetation so newly planted trees have the best chance for survival. Use Table 1 as a guide in determining appropriate site preparation methods.

### Cropland/Grassland

Areas with residue cover < 50% may not require site preparation. Residue cover > 50% will require site preparation. (See Table 1.)

If site preparation is needed, follow one or both of these methods:

Mechanical: Expose mineral soil. Limit tillage to no more than 2 months prior to planting or seeding. Till earlier if flooding is a possibility. Fall tillage is permissible for early spring planting. Use contour strip tilling on slopes greater than 3 percent. Planting strips should be at least 3 feet in width with inter-widths of 5 feet or greater.

Chemical: Apply appropriate chemical(s) in 3 to 4 feet bands over projected planting rows. If slopes exceed 3 percent, apply on contour. Use WIN-PST to evaluate leaching and runoff potentials. Pesticide/soil hazard risk ratings of "extra high" or "high" shall be accompanied by mitigating practices and/or substitution of pesticides will lower risk ratings. Use low volatile formulations. Some chemicals need extended time to work. Consider applying chemicals in the fall or early spring prior to establishment.

If a permanent cover crop is needed or desired after site preparation, use one of the following species at the specified rates to control potential erosion or weed competition between woody planting zones:

Species	Rate - PLS/Ac
<i>Ladino clover</i>	2.25 lbs
<i>Annual lespedza</i>	5.6 lbs
<i>Orchardgrass</i>	3.2 lbs
<i>Kentucky bluegrass</i>	1.6 lbs
<i>Timothy</i>	2.3 lbs
<i>Redtop</i>	1.3 lbs
<i>Virginia wild rye</i>	7.0 lbs

*Note: Above rates are for good planting conditions. Increase rates by 50% for fair planting conditions.*

For establishment methods, seeding dates, and fertilization (optional) with a permanent cover crop follow criteria in CONSERVATION COVER (327).

## Woodland

### *Desirable Vegetation*

Reduce competition from woody plants less than 2 inches DBH and other herbaceous competitors by mechanical, chemical, or prescribed burning means before underplanting. For underplanting with pine, kill all competing or undesirable vegetation less than 6 inches DBH.

Conduct burning only under controlled, predetermined conditions as outlined in a prescribed burn plan. Refer to PRESCRIBED BURNING (338). To reduce surface litter, burn after leaf fall in late November or early December. To control competing vegetation, burn in late spring.

Make a harvest cut and leave a well-spaced overstory of about 55 percent stocking. No cutting is necessary if the stand is already 55 to 65 percent stocked.

If successful regeneration is present, the remaining overstory may be removed during the dormant season after 3 to 6 years. For pine underplanting, remove any undesirable overstory within 1 to 3 years.

### *Undesirable Vegetation*

Harvest any merchantable material. Then use one or more of the following site preparation methods:

Mechanical: Remove remaining cover to expose mineral soil. Pile debris in windrows. On slopes greater than 3 percent, operations should be on the contour. On land that is gullied, some additional grading may be necessary.

Chemical: Apply appropriate chemical(s) in 3 to 4 feet bands over projected planting rows. If slopes exceed 3 percent, apply on contour. Use WIN-PST to evaluate leaching and runoff potentials. Pesticide/soil hazard risk ratings of "extra high" or "high" shall be accompanied by mitigating practices and/or substitution of pesticides will lower risk ratings. Use low volatile formulations. Some chemicals need extended time to work. Consider applying chemicals in the fall or early spring prior to establishment.

Prescribed Fire: Conduct burning only under controlled, predetermined conditions as outlined in a prescribed burn plan. Refer to PRESCRIBED BURNING (338). To reduce surface litter, burn after leaf fall in late November or early December. To control competing vegetation, burn in late spring.

## REFERENCES

*A Guide for Prescribed Fire in Southern Forests; USDA Forest Service, Southeastern Area; 1978.*

*Bottomland Hardwood Reforestation in the Lower Mississippi Valley; USDA Forest Service; 1989.*

*Silvics of North America; Vols. 1 and 2. Handbook #654. USDA Forest Service. 1990.*

*Planting Northern Red Oak in the Missouri Ozarks. Paul Johnson. USDA Forest Service. 1985.*

*Artificial Reforestation of Shortleaf Pine. USDA Forest Service and Missouri Department of Conservation. 1984.*

**Table 1.** Site preparation guidelines.

Site preparation methods noted for each category are suggested options based on cover and type of establishment method. (NOTE: Specific site conditions may not allow the use of indicated site preparation options. Make appropriate adjustments based on field conditions and observations)

<b>Cover</b>	<b>Establishment Methods:</b>		
	<b>Direct Seeding</b>	<b>Natural Regeneration</b>	<b>Seedling/Container</b>
<i>Cropland</i> Residue level < 50% cover	<i>Site Preparation Options</i>		
	C,N	C,N	C,N
>50% cover	C,M,MC	C,M,MC	C,M,MC
<i>Grassland</i>	C,M,CB,MC	C,M,CB,MC	C,M,CB,MC
<i>Woodland</i> understocked	<i>not recommended</i>	C,B,H	C,B,H
undesirable	C,M,MC,B,MB,CMB,H	C,M,MC,B,MB,CMB,H	C,M,MC,B,MB,CMB,H

M - Mechanical  
 C - Chemical  
 B - Prescribed burning  
 N - Not necessary  
 MB - Mechanical and prescribed burning  
 MC - Mechanical and chemical  
 CB - Chemical and prescribed burning  
 CMB - Chemical, mechanical and prescribed burning  
 H - Harvest cut